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M. W. Boyer, General Manager

May 15, 1952

Shields Warren, Director, Division of Biology and Medicine

MONTHLY STATUS AND PROGRESS REPORT, APRIL 1952 -
DIVISION OF BIOLOGY AND MEDICINE

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Transmitted herewith is the Monthly Status and Progress Report for this Division covering the month of April 1952.

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Report

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DOE 5650.2, II-12
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MONTHLY STATUS AND PROGRESS REPORT
Division of Biology and Medicine
MONTH OF APRIL, 1952

Weapons Test Activities

Fall-out Studies ([redacted]) Dust and fall-out measurements are being made at and near the Nevada Test Site within the 10 to 50 mile radius from ground zero for three of the tower detonations of the Tumbler-Snapper series. The monitoring teams include 20 civilian personnel and 12 enlisted men from the Armed Forces.

The objectives of the program are:

1. To measure the radioactivity per cubic meter in air for 24 hours following a detonation.
2. To determine approximate size distribution of particles in the air.
3. To chart the pattern of fall-out within this area by the use of gummed paper at approximately 100 collecting points.
4. To obtain an outline and measurement of radioactivity of particularly hot areas by means of survey teams.

Greenhouse Report ([redacted]) Analysis of the results of the biomedical experiments conducted in connection with Operation "Greenhouse" has been completed. Some of the important results may be summarized as follows:

1. It appears that there is a relatively complete analogy between the injury produced by single doses of whole body radiation in animals and man—whether the source of radiation be a nuclear weapon or high voltage X-rays used in laboratory experiments.

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2. Investigation of the effects of neutrons using biological dosimeters showed that at the distance at which gamma radiation is still a significant biomedical hazard the contribution of neutrons to the total dose is not significant. The neutron flux is variable and will depend upon the assembly of the weapon.
3. Anatomical, histological, and other features of atomic bomb flash burns can be satisfactorily produced by intense thermal sources now available in the laboratory.

It was demonstrated that no burning takes place during 20-30 milliseconds after detonation of an atomic bomb, and that all thermal injury occurred in less than one second. It was also shown that ultra violet light from the bomb did not contribute significantly to the thermal injury.

4. Foxholes afford reasonable emergency shelter against blast and radiation, depending, of course, upon yield and distance from ground zero.
5. Occupants of aircraft passing through the stem of an atomic cloud are exposed to greater hazard from gamma radiation from external sources than from radiation from inhaled bomb debris.
6. The use of plants, such as Tradescantia, as biological dosimeters may be feasible. The number of breaks in the chromosomes of Tradescantia exposed to bomb radiation correlated very closely with dosages for X and gamma rays, and for neutron dosage when gamma radiation was screened out, thus providing as exact a measure of radiation as film badges or instruments.

Research Activities

Savannah River Site Biological Survey (UNCLASSIFIED) Two conferences were held in April in connection with the Biological Survey being conducted under the general direction of the Savannah River Project. All phases of the program were reviewed in detail.

The over-all survey is aimed to assure that initial changes in the fauna and flora of the region due to plant operation or released radioactivity shall be recognized immediately and corrected. The program is divided into the following four major subdivisions:

1. U.S. Public Health Service Studies of the biology, bacteriology, and chemical data on the Savannah River water with the view to determining its safety for human uses, and for fish which may be used by human inhabitants of the area.
2. The Philadelphia Academy of Natural Sciences Studies of the ecology of the Savannah River at various points to assemble data on the natural balance of life. This will make it possible to determine at any time in the future whether the conditions in the river are being changed by the introduction of radioactivity, or chemical wastes.
3. The University of Georgia Studies of the animals of land, pond, and stream, especially the insects, birds, and mammals.
4. The University of South Carolina Studies of the inhabitants of land, pond, and stream, especially the plants, fish, amphibia, and reptiles.

Industrial Health

Industrial Hygiene Program (UNCLASSIFIED) A specialized training program in industrial hygiene has been inaugurated by the Commission to meet the increased demand in this field. Additional industrial hygienists are now required at several Commission installations, and the expansion program will create an additional need.

The AEC-Industrial Hygiene Fellowship Committee has initially selected four candidates for academic training, and the course will be of one-year duration beginning in the fall of 1952. Administration of the program will be through the AEC Project, School of Medicine and Dentistry, University of Rochester, Rochester, New York.

Industrial Health Conference (UNCLASSIFIED)

In conjunction with the 1952 Industrial Health Conference recently held in Cincinnati, Ohio, the AEC sponsored an open meeting on Industrial Health in the atomic energy program. This was the first time the AEC has met with this organization, composed of associations of industrial physicians, nurses, hygienists, and

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dentists from all parts of the country. The opportunity to introduce such a large segment of the nation's medical reservoir to atomic energy industrial health problems through the informal association afforded by such a meeting is considered a valuable one. It is planned to continue to meet with this group regularly in the future.

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